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AUTHOR Adams, Wayne
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The Effect of Pre-Training on Long Term Memory Improvement

Wayne Adams

Colgate University

ABSTRACT

Recent research has shown that certain stimuli are better remembered 6-months after initial exposure than after one week. An alternative explanation of these findings was tested. The explanation posited that the younger children "remember" as well at one-week at 6-months later, but at the earlier testing many do not realize what aspect of the stimulus of experimenter wishes reproduced. Findings indicated that pre-training to insure that subjects understood relevant stimulus attributes did not improve one-week or 6-months performance.

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Wayne Adams
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One of the most striking findings of the recent Genevan research (Inhelder 1969, Piaget 1967) has been that retention of visual stimuli is dependent upon the operation schemes that underlie the cognition of those stimuli. More specifically, when young children are asked to remember a drawing which incorporates logical operations just beyond their present cognitive structures, their ability to produce the visual stimulus six months after the initial presentation seems to be greater than after only a week's delay. Those studies (Altemeyer, Fulton, & Berry 1969, Murray & Bausell 1970) which have attempted to replicate these findings have mostly done so.

Assuming that this phenomenon does exist, it seems that the improved performance must be attributed to a decoding or retrieval rather than storage component of the memory process. That is, given an initial exposure to a stimulus, the organism must in some way store a rather absolute representation, and later "read off" that representation as a function of his shemata; otherwise how else could he perform at a higher level given the passage of time and no re-exposure. However this implies an incredible storage capacity. Is every visual experience presented to the child accurately filed away? This seems difficult to accept, especially in light of many contemporary positions of memory and perception (Neisser 1969, Gibson 1967).

Other explanations are possible, and Altemeyer, et al. (1969) tested a very sensible alternative. These authors thought that as children become older they may

PS 006609

naturally tend to draw the criterion figures with greater frequency even without the initial exposure. Altemeyer's work, however, did not find support for this position.

Recently, Caldwell and Hall (1969) demonstrated that often children's poor performance on some tasks is due to their misinterpreting the directions of the experimental situation. That is, the task was seen to be something other than the experimenter intended. When the subjects were trained to understand the directions in the same way the experimenter meant them, younger and older children performed similarly.

Using this rationale another alternative explanation to the long-term memory phenomenon is possible. It might be argued that the long term improvement can be attributed to the child's misunderstanding of the experimenter's demands at the younger age, but as he grows older and has more experience dealing with adult direction, his understanding is more complete, and hence his performance improves.

Therefore, it was predicted that after given pre-training which insured that children knew which aspects of the stimulus array the experimenter deemed relevant, those children would perform as well on a one week recall task as they or control children would almost six months later. A seriated arrangement of sticks, as used previously (Piaget 1967, Inhelder 1969, Altemeyer, et.al. 1969), was chosen to be the visual array to be presented.

METHOD

Subjects. Thirty-six children ranging in age from 4.6 to 5.9 years ($\bar{X}$ = 5.2 years) served as subjects. The sample was composed of 18 boys and 18 girls who were attending nursery schools in the central New York area. Most subjects came from middle class families.

Materials. A 35 x 55.5 cm sheet of bright, yellow posterboard was used. Centrally mounted on the board was a seriated array of eight, red licorice stick candies. The candy length was graducted, from left to right, from 19 to 4.5 cm. Additional unmounted licorice sticks of various sizes and a clean piece of yellow posterboard were also used. Licorice candies were used to increase salience of the stimulus array. A construction rather than drawing performance task attempted to control for age differences in drawing ability.

Also, two sketch pads with 21.5 x 27.5 cm pages were used. On each of 4 white pages of one pad appeared two drawings of lines. In another identical pad there were 20 pairs of different geometric shapes. Both lines and shapes were drawn by using a felt tipped, black marker.

In the "lines" pad, displays were randomly arranged so that 8-10 seriated lines appeared on the right or left half of the page and on the other half of the page appeared 8-10 lines in one of several non-seriated arrays.

"Geometric design" pages were composed of two geometric designs (e.g., a triangle and circle) each sharing half of the page, again position being randomly assigned.

Procedure. S was brought by a male E to an experimental room adjacent to the nursery school room. S was told he was going to play a game which required him to select which of two pictures was correct. Experimental Ss were then presented the sketch pad on which appeared paired drawings of vertical lines. The control Ss were presented the sketch pad in which there were pictures of paired

geometric shapes, one of which was held constant over pages. Unknown to the children the seriated lines (or the constant geometric shape) were designated as correct and children were told after each choice whether they had been correct or wrong.

All children continued the discrimination task for twenty trials. Most all the children caught on quickly and gave correct responses for most of the trials.

After the discrimination trials were completed, E told S to look very carefully at a picture because S would have to make one just like it later. The seriated array of mounted licorice sticks was then presented for about thirty seconds during which time E reiterated that S should look at it very carefully so that he could remember it.

One week and six months later E returned and put in front of S a blank, bright yellow sheet of posterboard, identical to the one on which the licorice-stick array had been mounted. E told S to remember the picture of the licorice sticks he was shown previously and "make one just like it." E then showed S a large assortment of different sized licorice sticks, indicating that the picture should be made on the large yellow posterboard sheet with the candy sticks.

RESULTS

Each childs' reproduction was recorded by E and later evaluated according to accuracy of reproduction. The rating system for accuracy developed by Altemeyer et.al. (1969) was used. The reproduction was rated 1-9, with large scores indicating better reproductions.

Because the distribution of the performance scores did not appear normally distributed, a median test was employed for data analysis. Performance between the six-month ($\bar{X} = 3.2$) and the one week ($\bar{X} = 2.4$) testing periods was found to be significantly different $\chi^2(1) = 3.95$, $p < .05$. No differences were found between the

experimental and the control groups at either the one-week or six-months testing period. Nor were there any significant sex differences at either testing internal

DISCUSSION

This study hypothesized that the long term memory improvement phenomenon was due to many younger subjects not attending to relevant aspects of the stimulus array. By insuring that subjects knew these stimulus aspects were relevant, no differnces were expected to be found between one week or six months recall performance. The results of this study were not consistent with this expectation.

Because observations made following this study, it is known that most children can construct the seriated order of sticks if asked when the pattern is present to refer to. This finding, coupled with the results of the discrimination task used in this study, implies that children of this age "see" the pattern as seriated. This necessitates a view which says that operations on visible stimuli must be different or a modified form of operations used in information retrieval.

It should be noted that almost 57% of the subjects used by Altemeyer et al., and 68% of the subjects in this study did not improve (i.e., either performed worse or remained the same). Therefore, the process does not seem to effect over a majority of children. Overall, it appears that the intriguing long-term memory phenomenon presented by Piaget needs more theoretical and empirical clarification.

PS 006609

References

A'temeyer, R., Fulton, D. and Berney, K., Long term memory improvement: confirmation of a finding by Piaget. Child Development, 1969, 40, 845-857.

Caldwell, E. and Hall, V., The influence of concept training on letter discrimination. Child Development, 1969, 63-72.

Gibson, E., Principles of perceptional learning and development. New York: Appleton-Century Crofts, 1969

Inhelder, B., Memory and intelligence in the child. In Elkind, D., and Flavel, J. (Ed.) Essays in honor of Jean Piaget. New York: Oxford University Press, 1969.

Murray, F., and Bausell R. Memory and conservation. Psychonomic Science, 1970, 21 (6), 334-335.

Neisser, U., Cognitive psychology. New York: Appleton-Century Crofts, 1967.

Piaget, J., On the development of memory and identity. Worcester, Mass.: Clark University Press, 1969.

Footnote

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